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PATENT SPECIFICATION

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(19)

(54) IMPROVEMENTS IN OR RELATING TO JOINTS PARTICULARLY FOR USE IN FURNITURE

(71) We, PROJECT OFFICE FURNITURE LIMITED (formerly I BLOOHN LIMITED), a British Company, of Haverhill, Suffolk, and IVOR BLOOHN, a British Subject, of Project Office Furniture Limited (formerly I BLOOHN LIMITED, Haverhill, Suffolk, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to joints and is particularly, but not exclusively, concerned with joints for use in furniture. It is frequently necessary, in furniture, to join together three intersecting elongated members each of which extends transversely to the other two. For example such a joint may be used between the front cross-bar, side bar, and leg of a chair, or at the junction between the frame members of many other articles of furniture, such as desks and cabinets.

According to the invention there is provided a joint connecting together three insersecting elongated elements each of which extends transversely to the other two, wherein a first member is formed with a first aperture into or through which passes a second member, there being provided a tension element which passes into a hollow interior part of the first member and has a screw-threaded portion which engages a threaded aperture, formed in the second member and disposed within the first member, so as to secure the two members together, and wherein the tension element also engages a third member and secures it to the first member.

The tension element may also pass through a third aperture, in the third member, having a head larger than said third aperture so that the third member is clamped between the head and the first member.

The first member may have spaced side walls, the afersaid first aperture being defined by registering slots in the side walls, through which slots the second member passes. In this case the tension element preferably extends axially along the first member, between said side walls. The tension element is preferably a close fit between the side walls of the first member. The first member may be tubular in form.

Preferably the third member at least partially embraces the junction between the first and second members. For example, the third member may have side walls formed with apertures through which the first and second members pass, the junction between the first and second members being disposed between the side walls. In this case the third member may be tubular in form.

In any of the above arrangements there may be provided two or more tension elements each of which passes into a hollow interior part of the first member and engages the part of the second member disposed within the first member so as to secure the two members together.

In any of the above arrangements also the three intersecting elongated members may be disposed with their longitudinal axes mutually at right angles.

The following is a more detailed description of various embodiments of the invention reference being made to the accompanying drawings in which:—

Figure 1 is a diagrammatic side elevation of a chair incorporating joints according to the invention;

Figure 2 is a front elevation of the chair as shown in Figure 1;

Figure 3 is a horizontal cross-section through one of the joints used in the chair;

Figure 4 is a vertical section on the line 4-4 of Figure 3;

Figure 5 is a section on the line 5-5 of

Figure 3; and

Figure 6 is an exploded view of the components of the joint of Figures 3 to 5.

Referring to Figures 1 and 2 the chair comprises a substantially H-shaped front frame 10 comprising two spaced uprights 11 connected by a horizontal cross-bar 12. Similarly the rear frame 13 comprises two spaced uprights 14 connected by a horizontal cross bar 15.

The front frame 10 and rear frame 13 are interconnected on each side of the chair by horizontal side members 16, the side members being at the same general height as the front and rear cross-bars 12 and 15.

Mounted within the framework thus provided is an assembly comprising a seat part 17 and a backrest part 18. The front of the seat part 17 rests on the horizontal front cross-bar 12 and the seat part is also supported by fixing devices 19*a* on the side members 16. Similar fixing devices 19 secure the backrest part 18 between the upper ends of the uprights 14 of the rear frame.

In an alternative form of the chair the uprights 11 of the front frame are extended upwardly as indicated in chain lines at 30 in Figure 1 and an armrest, indicated in chain lines at 31, extends between each front upright 11 and the corresponding rear upright 14.

The manner in which each cross-bar 12 or 15 and each side member 16 are connected to an upright is shown in greater detail in Figures 3 to 6, which show the connection between the front horizontal cross-bar 12, (which constitutes the second member of a joint embodying the invention) the right hand side member 16 (which constitutes the first member of the joint) and the right hand upright 11 of the front frame of the chair (which constitutes the third member of the joint).

Referring to Figure 3 it will be seen that the upright 11 is in the form of a generally square section hollow metal tube. The tube 11 is formed in its rear wall with a rectangular slot 20 through which passes the front end of the side member 16. The side member 16 is also tubular and is in the form of an elongated rectangle in cross-section (as best seen in Figure 5) and the front end of the side member 16 abuts against the inner surface of the tubular upright 11 opposite the slot 20.

The side walls of the side member 16 are formed with registering slots 21 which also register with a similarly shaped slot 22 in a side wall of the tubular upright 11. The front cross-bar 12 passes through the registering slots 22 and 21 and its end abuts the inner face of the side wall of the upright 11 opposite the slot 22. The cross-bar 12 and the slots 21 and 22 through which it passes are of elongated cross-section and rounded at their upper and lower edges as best seen in Figure 4.

The part of the cross-bar 12 which is disposed within the tubular side member 16 is formed with two spaced threaded holes 23, one above the other. Received within the threaded holes 23 are two screws 24 which pass through holes 25, registering with the holes 23, in the front wall of the tubular upright 11. The size of the screws 24 is such that the screws are a close fit within the tubular side member 16. The heads 26 of the screws overlie the front surface of the upright 11. The heads of the screws are formed with hexagonal sockets 27 to receive a similarly shaped key to tighten or loosen the screws.

It will be appreciated that tightening of the screws 24 will firstly draw the cross-bar 12 hard against the sides of the slots 21 and 22 and will then draw the end of the side member 16 hard against the interior surface of the tube 11 so as to lock the three members together.

Similar connections are provided at the other three locations on the chair where a side member meets a cross-bar and upright.

It will be appreciated that many modifications may be made to the arrangement described without departing from the scope of the invention. For example any number of screws 24 may be used to provide any required strength. In some cases only a single screw engaging a single threaded hole in the cross-bar 12 may be necessary.

Further the cross-sectional shapes of the members and their axial construction may be varied. For example the cross-bars 12 and 15 could be oval in cross-section instead of being of the elongated cross-sectional shape shown. Similarly the uprights 11 and 14 and the side members 16 can be of any convenient cross-sectional shape. It will be appreciated that the various slots through which the elements pass will also require to be shaped in accordance with the cross-sectional shape of the elements.

In some cases it may be necessary to provide washers under the heads of the screws 24.

It will be appreciated also that the connection described is not limited in application to constructing the frames of chairs but may be applied to the construction of many other different kinds of furniture, for example tables, shelving units, and frames for cabinets. The connection is also capable of wider application in other fields where it is required to secure together at a single point three intersecting elongated members. It will be understood

that the members need not intersect mutually at right angles but by suitable shaping and positioning of the slots the members may be arranged to intersect at varying angles.

WHAT WE CLAIM IS:—

1. A joint connecting together three intersecting elongated elements each of which extends transversely to the other two, wherein a first member is formed with a first aperture into or through which passes a second member, there being provided a tension element which passes into a hollow interior part of the first member and has a screw-threaded portion which engages a threaded aperture, formed in the second member and disposed within the first member, so as to secure the two members together, and wherein the tension element also engages a third member and secures it to the first member.

2. A joint according to claim 1 wherein the tension element passes through a third aperture, in the third member, having a head larger than said third aperture so that the third member is clamped between the head and the first member.

3. A joint according to claim 1 or claim 2 wherein the first member has spaced side walls, the aforesaid first aperture being defined by registering slots in the side walls, through which slots the second member passes.

4. A joint according to claim 3 wherein the tension element extends axially along the first member, between said side walls.

5. A joint according to claim 4 wherein the tension element is a close fit between the side walls of the first member.

6. A joint according to any of claims 1 to 5 wherein the first member is tubular in form.

7. A joint according to any of the preceding claims wherein the third member at least partially embraces the junction between the first and second members.

8. A joint according to claim 7 wherein the third member has side walls formed with apertures through which the first and second members pass, the junction between the first and second members being disposed between the side walls.

9. A joint according to claim 8 wherein the third member is tubular in form.

10. A joint according to any of the preceding claims wherein there are provided two or more tension elements each of which passes into a hollow interior part of the first member and engages the part of the second member disposed within the first member so as to secure the two members together.

11. A joint according to any of the preceding claims wherein the three intersecting elongated members are disposed with their longitudinal axes mutually at right angles.

12. A joint connecting together three intersecting elongated elements and constructed and arranged substantially as hereinbefore described with reference to Figures 3, 4, 5 and 6 of the accompanying drawings.

13. An article of furniture comprising three intersecting elongated elements each of which extends transversely to the other two, wherein the elements are connected together by a joint according to any of the preceding claims.

14. A chair having four spaced upright legs interconnected by cross-bars extending transversely between the legs, wherein an upright leg is connected to two cross bars by a joint according to any of claims 1 to 12.

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3 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 1

Fig.1.

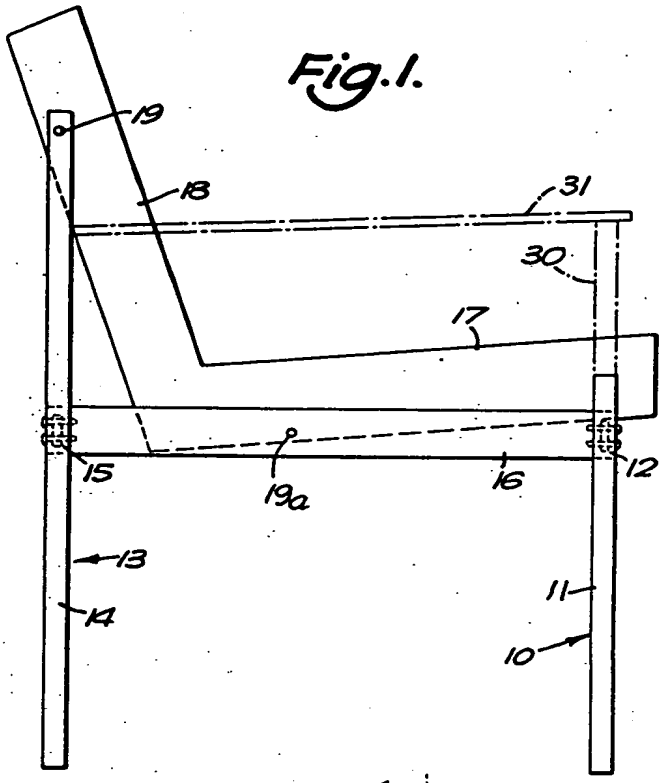
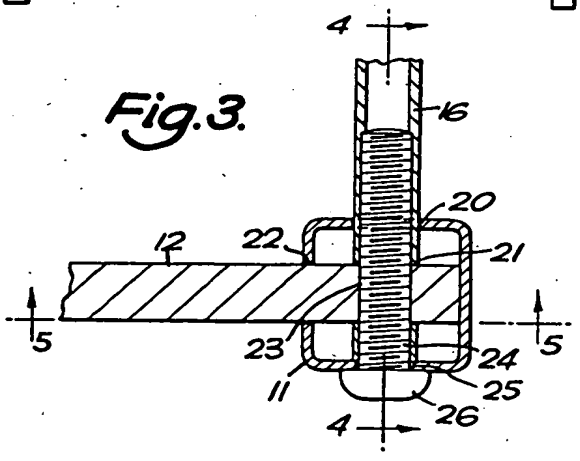


Fig.3.



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3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
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Fig.2.

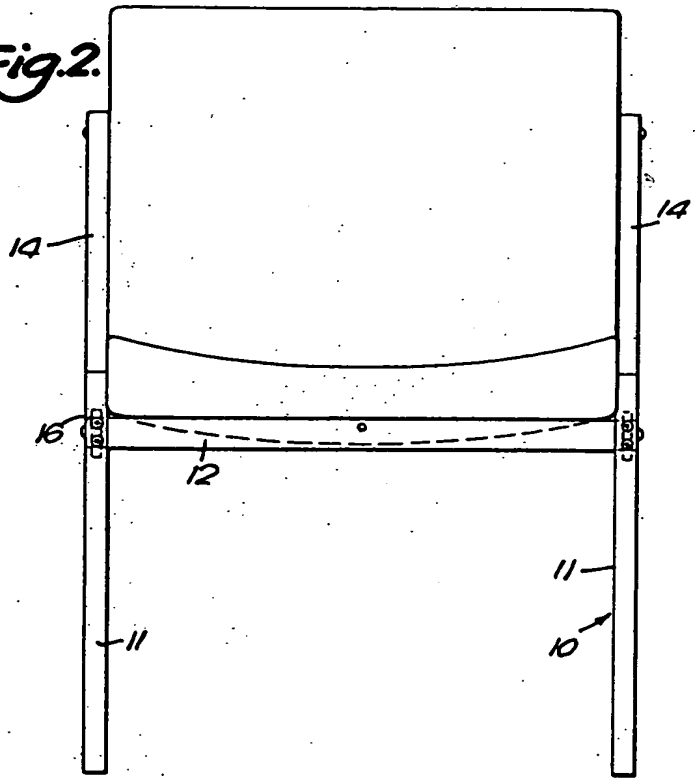
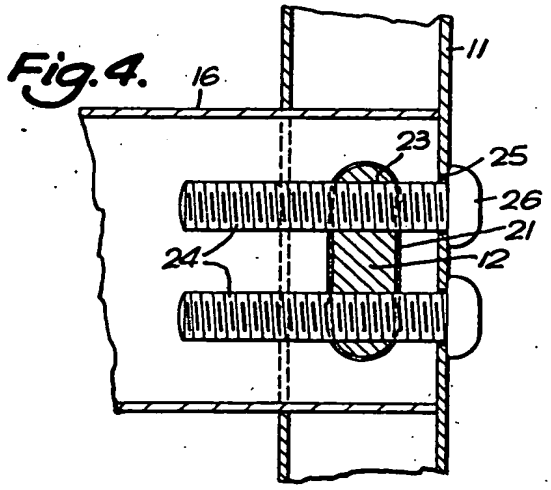


Fig.4.



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Sheet 3

Fig.5.

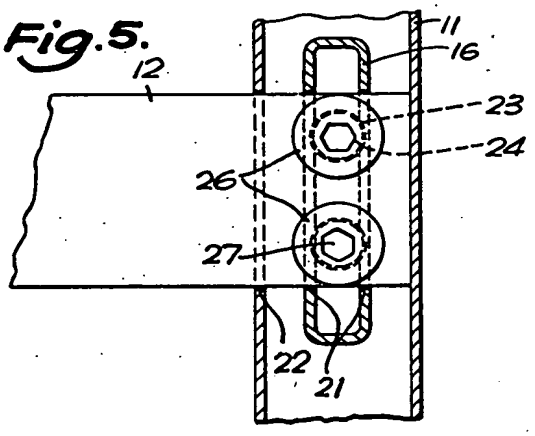

Fig.6.